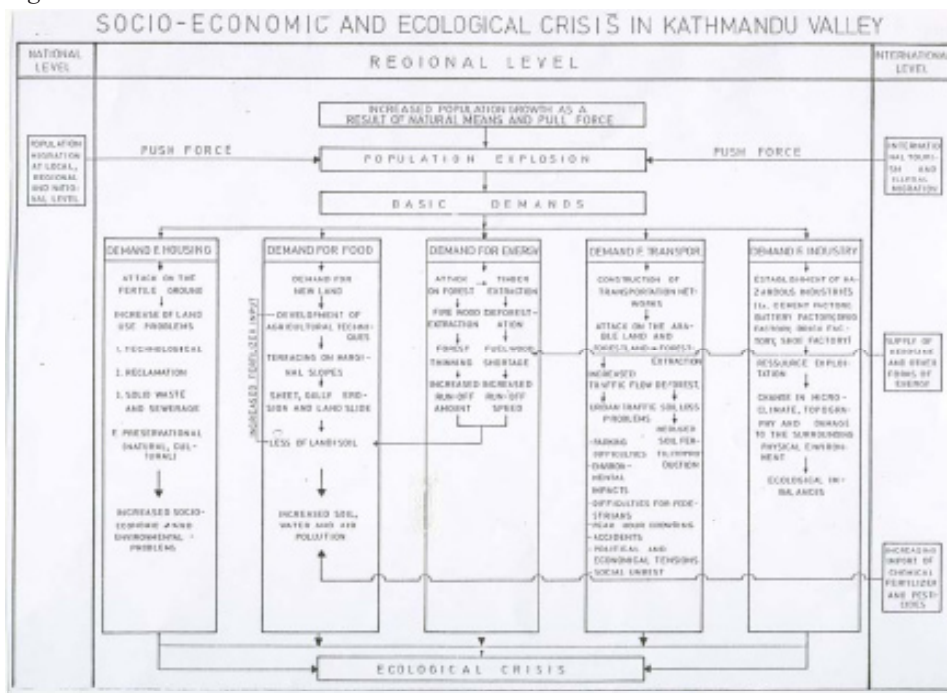


3 IDENTIFICATION OF THE PROBLEMS

The ecological problems of landscape and environment have become one of the greatest concerns all over the world. Among them, the basic failure to develop urban, sub-urban and rural communities taking into account natural hazards has produced the present situation where many towns and small communities have expanded rapidly into a modern industrial complex of physical environment. The problem of urbanization and industrialization had been felt all over the world during the past decades and many activities such as conferences, seminars, training etc. have been organized by many national and international organizations. As the 1980 Rome Conference on Population and urban future declared, "a fair distribution of wealth among nations is necessary and at the same time internal changes are necessary to ensure an equitable distribution of resources. The objective of managed population growth and planned urbanization must be to achieve a balanced allocation of resources and development opportunities and of economic and social benefits resulting from them" (Rome Declaration, UNEP, 1980). One of the negative outcomes of rapid urbanization and industrialization is the growing degradation of metropolitan and sub-urban landscapes as well as the destruction of these areas and their specific climate. But the conventional wisdom is that the movement of people from farm to city and vice versa will continue throughout the century. This process is neither inevitable nor desirable. The basic reason for the degradation of the urban landscape is the lack of rational space management in contact with a harmonious landscape. Furthermore, if the flow of population from the countryside to the city should continue unabated, some harsh corrections in the not too distant future will be inevitable. Among these will be food crisis, energy crisis, unemployment and, above all, environmental crisis. Finally, all these crisis will possibly lead to social unrest and political instability. Apart from the great financial burden of the socio-economic and environmental crisis of the urban Kathmandu, there is a pressing need to arrest and reverse the ecological deterioration of the countryside now under way in many loosely populated areas. (see Fig. 1).

The Kathmandu Valley and especially the Kathmandu metropolitan area represents a very nice example of this dilemma. Poor spatial planning for various functions such as housing, industries, municipal services, communications, agriculture and open spaces etc. has mushroomed and made the planning necessary to cope with the present trends of developmental processes and phenomena more complex. The industrial plants, though limited in size and number, are scattered in a haphazard manner and do not give the city the air of an industrial town. The residential areas are moving further and further away from the urban core to the suburbs and the centre of the city is turning into an employment zone. Prevention of this trend is one of the most pressing problems today and keeping the inner city a natural genofound and a home of traditional culture appears to be vital. The fragile areas of the metropolitan surroundings are being easily invaded by unconstrained urban agglomeration, industry and their infrastructures, and these extremely burdensome dynamics and frequently uncontrolled changes are accompanied by an atmosphere of uncertainty caused by temporary situations and the lack of care for spatial order, hampering the creation and maintenance of a beautiful and ordered landscape.

Fig. 1



At present, Kathmandu reflects the following unfavorable changes resulting from inappropriate land use allocation, insufficient management and lack of control over the urban landscape and its surroundings:

- wasteful exploitation of natural resources manifesting itself in the air, water and soil pollution, but, above all, in uncontrolled industrial, municipal and agricultural waste disposal occur throughout the research territory;
- extravagant treatment of areas without sufficient judgment of the aims;
- weakening of biological activity caused by exploitation and devastation of natural resources;
- problems of soil erosion, land-slides, floods and siltation as a result of deforestation, overgrazing and large-scale cultivation near the surrounding areas and hills of the Kathmandu Valley.

The detailed environmental and socio-economic problems resulting from urbanization and industrialization have been discussed on the basis of ground literature and personal experience and the problems have been identified in the following observations.

3.1 Landscape-ecological land use conflicts

This type of land use conflicts are caused by insufficient consideration of the landscape-ecological potential (landscape-ecological conditions of the site). The following land use conflicts are considered to be serious in Kathmandu:

- destruction of arable land in Kathmandu with its increased rate of urbanization, industrialization and siltation (marshyness);
- destruction of the original vegetation cover (accelerated deforestation and its impact on arable land, settlement and industrial areas and
- disappearance of fauna as a result of the direct human attack and loss of habitat.

3.2 Environmental land use conflicts

These land use conflicts are the result of direct or indirect impacts of human activities on the landscape potential of the research territory. The major environmental land use conflicts are:

in the framework of the agricultural sector:

- Soil erosion, land-slides, loss of topsoil and partial desertification by too intensive cultivation of the field terraces and over-grazing without corresponding erosion counter measures;
- Rapid run-off and sinking of the ground water level by the destruction of the vegetation cover;
- Flash-flooding and siltation as a result of the inappropriate land use of the landscape ecological sites in the investigated territory;
- Destruction of the organic nutrients in the soil due to the over-use of chemical fertilizers and increased application of unsuitable seeds;
- Sinking of the ground water level by over-irrigation of the arable land;
- Deforestation and illegal fire, particularly around the margins of the Kathmandu Valley and
- Prolongation (extension) of the dry period in the winter season by the decreased water capacity (storage) and dried-up water wells.

in the framework of urbanization and industrialization:

- Superficial and ground water pollution caused by the failure of the technical infrastructure from sewerage and purification plants;
- Air pollution caused by increased fire wood consumption, industrial pollutants and traffic flow and congestion;
- Impending drainage caused by the expansion of construction activities in the lower irrigated land which is already exposed to the increased hazard of floods and
- Landscape deterioration caused by municipal and industrial solid waste.

3.3 Socio-economic land use conflicts (neighbouring land use conflicts)

These land use conflicts are caused by the mutual as well as spatial incompatibility of the present-day land use forms. These neighboring land use conflicts depend upon the special interest of the particular individual or the group of society. Three main neighboring land use conflicts have become obvious as a result of:

- The block-up and negative influence of the functional elements of the particular land use form caused by unplanned and irregular town buildings with a chaotic mixture of industrial, residential and recreational use;
- The block-up of the information and materials flow within the key sectors owing to uncoordinated urban-rural planning and
- The low compactness, fragile nature and irregular expansion of the Kathmandu Valley.

3.4 Problems of the environmental and landscape planning

The environmental as well as the landscape-ecological planning in Nepal in its present state cannot fully contribute to solve the environmental problems in Kathmandu Valley.

The main constraints for the landscape-ecological planning are:

- Lack of priority for urban-suburban development;
- Lack of capacity to follow an appropriate problem-solving methodological approach;
- Lack of planning and investment coordination;
- Lack of political will and administrative capacity to enforce planning guidelines and regulations;
- Lack of effective use and integration of taxation in guiding the Urban development process;
- Lack of skilled professionals;
- Lack of effective planning capacity;
- Lack of an adequate data base for planning and management;
- Lack of sufficient and appropriate development standards;
- The failure to consider the full potential opportunities and problems associated with urban investments; and
- The failure of the government to run an integrated approach with the help of professionals of various disciplines to cope with the burning situation.

3.5 Basic objectives of landscape-ecological planning for Kathmandu

Based upon the current landscape-ecological problems and according to the socio-economic demands of the research territory, the study has recognized to fulfill the following objectives:

Investigation of the landscape-ecological potential of the research territory for the land use suitability:

- Delimitation of priority areas for the arable land, settlement, industry, traffic, forestry and nature protection;
- Evaluation of the present-day land use potential: Identification of the possible landscape-ecological conflicts, i. e. the suitability of the landscape-ecological properties of the research territory for special functional elements;

Investigation of the environmental land use conflicts:

- Reduction of soil erosion, land-slides, rapid run-off, flash-flooding and siltation by optimal utilization of landscape resources;
- Reduction of the over-utilization of chemical fertilizers with consideration of the soil-ecological conditions (ecologically differentiated fertilization);
- Reduction of the air pollution by appropriate allocation of industrial, settlement and sewerage plants by consideration of the geomorphological and climatic conditions in the research territory;
- Reduction of the superficial and ground water pollution from municipal and industrial waste water by allocation of industrial plants and settlements after consideration of the superficial and ground water conditions of the research territory and
- Reduction of the impairment of the landscape scenery around the settlements and industrial plants using the natural and cultural supply of the investigated territory;

Investigation of the socio-economic land use conflicts (neighboring land use conflicts):

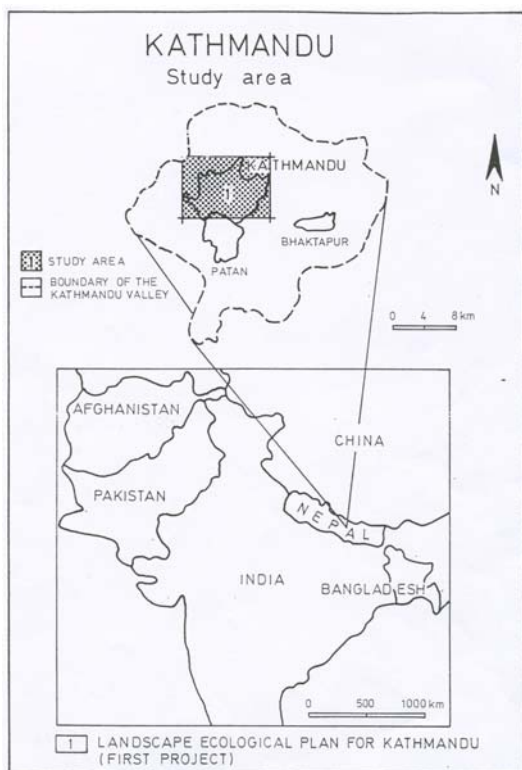
- Delimitation between the settlement area and the agrarian land (territory);
- Evaluation of the current spatial neighboring incompatibility of the particular functions in the town and
- Elaboration of the landscape ecological plan with the proposal of ecological optimal land use, which can serve as a planning tool for the reduction of the environmental problems of urbanization and industrialization in the Kathmandu Valley.

3.6 Importance and delimitation of the planned territory

Kathmandu City, the capital of Nepal and part of Kathmandu Valley proper, lies in the Central Region of the Midland Himalaya of Nepal (see Fig. 2).

Beyond being a simple geographic entity surrounded by mountains of varied altitudes and summits, Kathmandu is a defined unit in terms of history, cultural pattern and human interaction. Invaluable cultural heritage, diversified ethnic groups from all parts of Nepal, a holy place for both Hinduism and Buddhism alike and the presence of the varied mixture of natural scenery are the main characteristics of this planned territory. This area with an elevation of + 1400 m above sea level obviously not only provides an agreeable climate for the inhabitants, but also favours farming and agriculture, a large number of small-scale industries, commerce and tourism which are needed for its successful development. All cereals, every kind of fruit and vegetable of the sub-tropical to the temperate zone thrive in this bed of a pleistocene lake.

Fig. 2



It has been the hub of Nepal's political, administrative and commercial affairs for many centuries. It has also been the hub of Nepal's artistic and cultural heritage. The work of the valley's builders and craftsmen, especially in sculpture and wood carving, was widely known far away from the valley in historic times. Location of the national government headquarters, formulation of all plans, policies and programs have dominant influence over the other parts of the country. Another significance is that it serves as the primary diffusion point for social change in the country. The modernization process through education and adoption of western ideas and ways of life has evolved in this capital and the diffusion of this process to other parts of the country has begun from this idea.

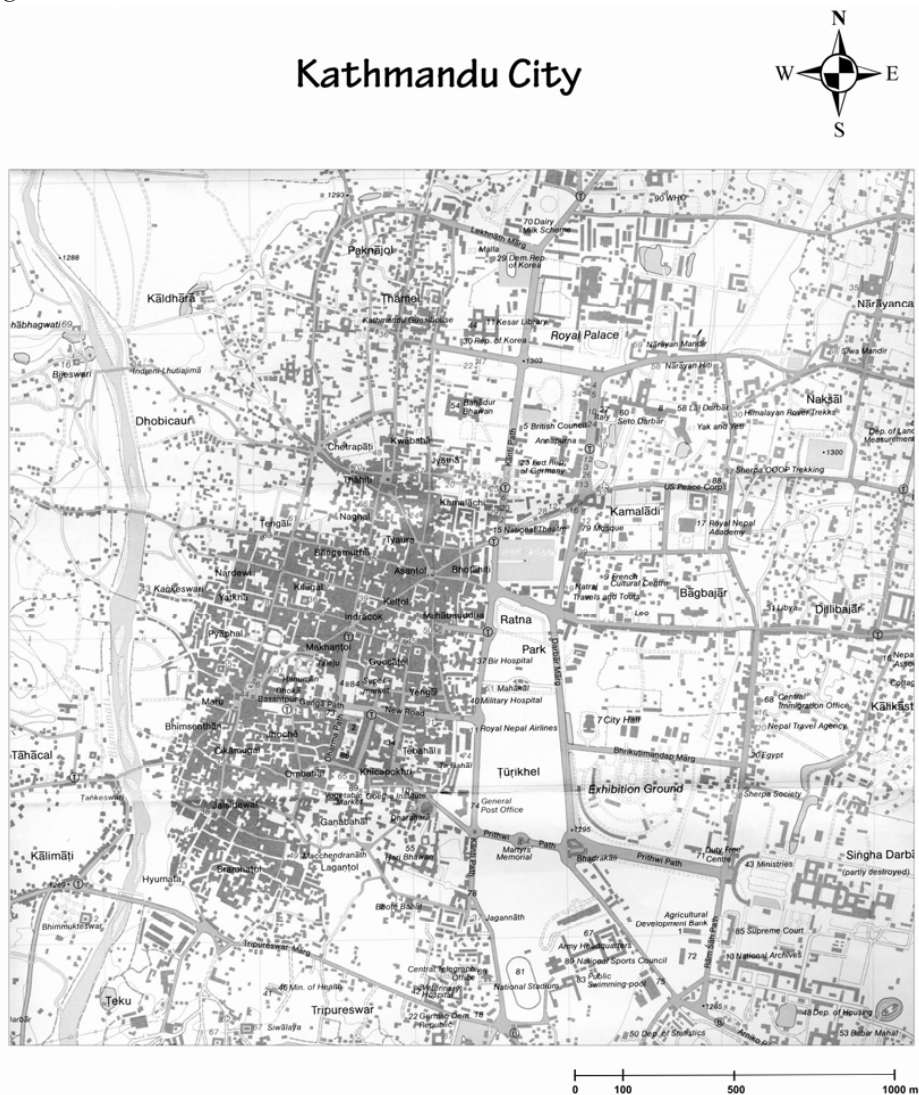
Opening of the modern traffic system during 1956 and construction of many modern highways connecting other regional parts of the country

have contributed a lot to the economic development as well as socio-cultural exchange among the people of the various ethnic groups. The rapid manner in which Nepal and the Kathmandu valley in particular have been opened up to the traffic is an exemplary illustration of what this once isolated and xenophobic Himalayan nation has now become: not only a tourist attraction of the first magnitude, but a confident nation of the third world. Kathmandu, by virtue of being the national capital and a crossroads of international routes, is a place where much interaction at an international level takes place; social transformation and change caused by the influx of western tourists have clearly been perceptible in Kathmandu.

3.7 Criteria for the selection of the site for the study purpose

Kathmandu, being one of the most important and fastest-growing urban centres of Nepal, is also facing several problems since a few decades. Its development could be hampered if necessary steps are not taken immediately by the concerned authorities. Its future will be determined by proper planning and sufficient scientific judgement of the planners, decision makers and politicians. (see Fig. 3).

Fig. 3



Detail from Kathmandu City Map (1:10 000). Source: Nepal-Kartenwerk der Arbeitsgemeinschaft für vergleichende Hochgebirgsforschung Nr. 21, Munich 1979.

However, the justification for the choice of this area is based upon several criteria. Besides its unlimited roles and functions, the following are the main criteria for the selection of the planned territory:

- The availability of information
- Presence of transportation and communication facilities
- Geographical compactness
- Presence of relevant organizations (governmental and non-governmental)